

Population Surveys of Endangered Egyptian vulture (*Neophron percnopterus*) in Mahasheer National Park Kotli, Azad Jammu and Kashmir

Muhammad Kabir¹, Urwah Shamas², Shakeel Ahmad³ and Muhammad Naeem Awan^{4*}

¹Department of Forestry & Wildlife Management, Haripur University, Pakistan

²Carnivore Conservation lab, Quaid-i-Azam University, Pakistan

³Hagler Bailly, Islamabad, Pakistan

⁴Earth Day Network, Islamabad, Pakistan

*CorrespondingAuthor:ajkwildlife@gmail.com

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Abstract

The global distribution and population of the Egyptian Vulture (*Neophron percnopterus*) has declined but the species remains poorly studied in the Azad, Jammu and Kashmir area of Pakistan. This lack of information about the species limits the ability to adopt strategies for its conservation. This study was conducted in four selected sites of northeast Pakistan to estimate the population status of Egyptian vultures in the study area. Potential sites and colonies of the Egyptian vultures were first identified and then monitored using point count methods. We counted a maximum of 121 Egyptian vultures across the four sites that were surveyed in the study area. Conservation action at the State level is needed to help protect this vulture species of global conservation concern, and our results provide a baseline from which future monitoring can proceed.

Introduction

Outside the seas, the only known obligate scavengers are vultures (Ruxton & Houston 2004), a group of species that provides important ecological, cultural and economic services (Ogada *et al.* 2012). The Egyptian Vulture (*Neophron percnopterus*) is a moderate-sized scavenger weighing approximately 2kg and with a wingspan of about 170cm (Donázar *et al.* 2002, Forsman 1999). Globally, the species is widely distributed in southern Europe, northern Africa, South and West Asia, and in some countries surrounding China such as India, Nepal, Pakistan, Afghanistan, Tajikistan, Kyrgyzstan and Kazakhstan (Cramp & Simmons 1980, del Hoyo *et al.* 1994, Hong & Ming 2012).

Over recent decades and due to a variety of threats, mainly from human activities (Sarà & Di

Vittorio 2003, Cuthbert *et al.* 2006, Carrete *et al.* 2007), the population of Egyptian Vultures has decreased and it is categorized as Endangered (BirdLife 2012). There are now estimated to be between 21, 900 and 30, 000 Egyptian Vultures in the world (BirdLife 2012). Despite this decline in the population and distribution of Egyptian Vultures, the species remains categorized as Least Concern in Pakistan (IUCN 2016).

Historically, among South Asian avifauna, vultures were numerically common (Gilbert *et al.* 2002) and approximately half of the global population of Egyptian Vultures was estimated to exist in the Indian subcontinent (del Hoyo *et al.* 1994). However, the Egyptian Vulture population in the Indian subcontinental region is estimated to have undergone an approximately 90% reduction from the mid-1990s to the mid-2000s (Galligan *et al.* 2014), a more substantial decline from earlier

estimates of 63% (Cuthbert *et al.* 2006), which led to the conservation status of the species being changed to Endangered in 2007 (BirdLife 2012).

In Pakistan, seven vulture species were once seen all across most areas (Roberts 1992). More recently, during a survey conducted at 77 different localities all over Pakistan, a total of only 457 Egyptian vultures was recorded, consisting of 51, 359 and 47 individuals sighted in Punjab, Sindh and Baluchistan Provinces respectively (Iqbal *et al.* 2011). No Egyptian Vultures were recorded in area of Azad, Jammu and Kashmir in northern Pakistan.

In Pakistan, the status of vultures is not clearly known and has not been updated since 2011. In particular, there is very limited information available that describes the distribution, population and threats to the survival of Egyptian Vultures. Due to this scarcity of information and limited research, it is difficult to address the conservation issues outlined in Pakistan's National Vulture Conservation Strategy (IUCN 2016). Thus, the present study was conducted to develop baseline data on the distribution and population of Egyptian Vultures in the Kotli District of Azad Jammu and Kashmir (AJK). We present current information and provide a basis for future monitoring of this globally endangered vulture species in line with the National Vulture Conservation Strategy (IUCN 2016).

Material and Methods

Study Area

The study was conducted in Poonch River Mahasheer National Park (PRMNP) in AJK

(Figure 1). The Poonch River was declared as a national park due to its high fish diversity and importance for species of both conservation and economic importance, particularly the Endangered Mahasheer (*Tor putitora*), which is important from both a conservation and a recreational/economic viewpoint.

The study area consists of high hills with steep slopes and narrow valleys, common to the foothills of the Himalayan range. The area is a transitional zone between plains and foothills of the Himalayas and provides diverse habitats for bird species such as winter migrants from higher altitudes and summer migrants from lower altitudes. PRMNP lies within a humid subtropical zone and its climate is influenced by the monsoon and snowcapped mountains of the Pir-Panjal Range. Temperature in the area varies according to elevation, with maximum temperatures ranging from 17.6 °C in January to 38.4 °C in June. Monthly mean minimum temperatures range from 4.8 °C in January and 24.9 °C in June.

Mammalian species present in the area include common leopard (*Panthera pardus*), Asiatic jackal (*Canis aureus*), red fox (*Vulpes vulpes*) and rhesus monkey (*Macaca mulatta*) (Roberts 2005, Akbar & Anwar 2011). The study area also supports a diversity of avian species and about 61 species of birds are recorded, along with approximately six species of amphibians and 15 reptiles, including three species that are endemic to Pakistan: two lizards - Agrore valley agama (*Laudakia agrorensis*) and Rohtas gecko (*Indogekko rohtasfortai*) and one snake - Slender blind snake (*Typhlops ductuliformes*). The Poonch river is rich in aquatic diversity and contains at least 37 fish species, two of which are endemic to the region.

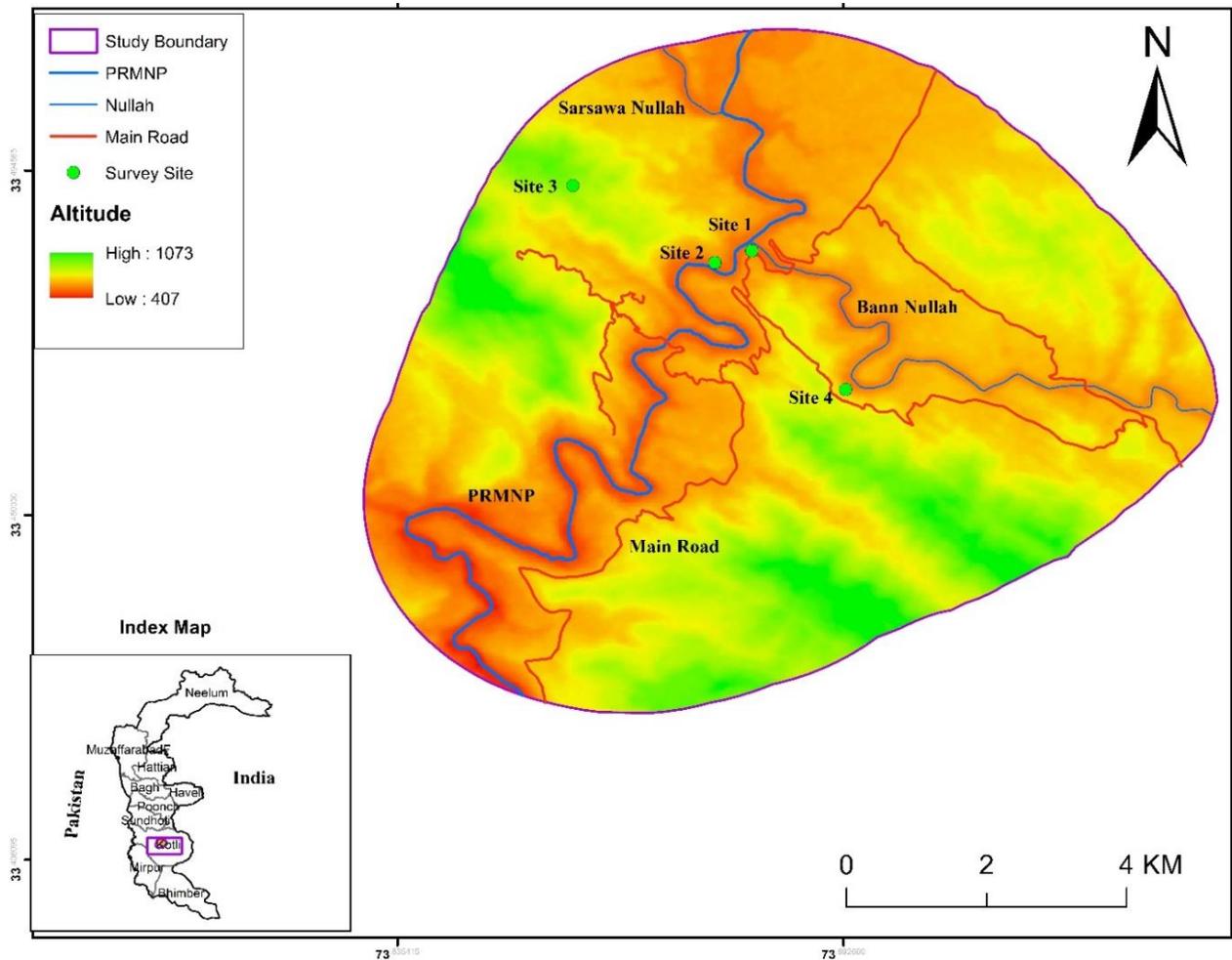


Figure 1: Study Area showing the survey sites of Egyptian vulture in northeast Pakistan.

Survey Method

Fieldwork and surveys were conducted between February 2013 and January 2014 to develop baseline data on the distribution and population of Egyptian Vultures in PRMNP. Initial visits over 12 days were made to locate potential places where vultures might be found and to gather information from local communities. This secondary data was used to identify the most likely sites and occurrence spots of vultures in the study area. Four vulture roosting, feeding or colony sites were selected (Figure 1) after observations of prevailing conditions and vulture occurrence. For seven (7) days in each season (spring, summer, autumn, winter) visits were made

to count Egyptian Vultures at all sites.

The point count method was used according to the terrain and feasibility of this method in each area. The point count is advantageous because it is an inexpensive method to measure relative abundance of birds in an area (Huff *et al.* 2000) and this method is a commonly-used for monitoring birds (Huff *et al.* 2000, Arrowood *et al.* 2001, Ross *et al.* 2003).

At each site, all vultures observed using binoculars (magnification 7x) and spotting scope (AE Spotting Scope 20-60x60) were recorded and grouped into three age categories following Donázar *et al.* (1996) as follows: Adults (individuals with definitive plumage, 4 years old or older), sub-adult (Individuals with intermediate

plumage, 1-3 years old and Juvenile (recently fledged nestlings). During field visits data on weather, time and main habitat type was also recorded. To minimize double counting, the counts were made at the same time by a team of three observers at each of the four sites.

Questionnaires were conducted near vulture colonies to understand the methods adopted by local communities for carcass disposal, persecution of vultures and attitude towards vulture conservation. Collected data was analyzed using the simple statistical tools in Microsoft Excel.

Results and Discussion

The number of Egyptian vultures recorded during the initial surveys can be seen in Figure 2. Various ecological pressures such as human disturbance, climatic conditions and availability of food can produce variation in vulture populations (Thomson *et al.* 1990, Donázar & Feijoo 2002). Site I is the location of a dumping place for butcher shops, so food resources for vultures at this site are likely to be more abundant. The high availability of food throughout most of the year provides an

explanation for the higher count of birds seen at this site (Figure 2). Site III is located along the Poonch River and food resources at this site are expected to vary throughout the year, possibly explaining the smaller number of vultures counted there (Figure 2). Food limitation is known to be a contributor to variation in populations of Egyptian Vulture (Abbas *et al.* 2013).

Abundance of Egyptian Vultures varied at different sites in different seasons (Figure 3). According to Venkitachalam & Senthilnathan (2016), at least four species of vultures found in India have shown seasonal movements. In our study, during summer, counts at Site I were the highest, probably due to abundant food resources and nesting sites in this location. Higher food availability in summer has been recorded as a possible cause of increased numbers of Egyptian Vultures elsewhere (Ceballos & Donázar 1990). During autumn, the lower number of vultures counted at Site I is possibly due to movement of vultures from that site to other suitable places in response to food availability. Food availability and nest sites for vultures can act as limiting factors that limits the carrying capacity of a site (Kushwaha & Kanaujia 2010).

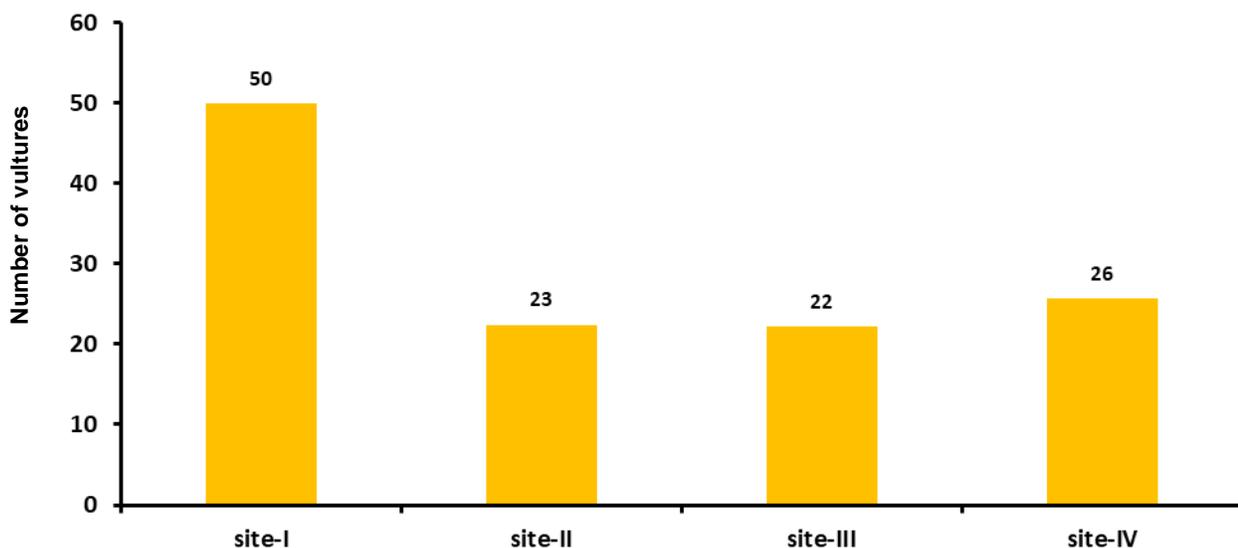


Figure 2: Numbers of Egyptian Vultures counted during initial surveys at four sites in northeast Pakistan.

At Site II, the number of vultures counted was highest in the spring (Figure 3) but like Site I had the lowest counts in the winter. In contrast, the seasonal variations at Site III are different to all the other sites and this site recorded the highest number of vultures in winter and lowest number in the summer (Figure 3). Site III is located adjacent to the Poonch River, which probably offers provide variable food resources during the year.

Finally, Site IV shows seasonal variations that are similar to Site I, with the highest number of vultures recorded in the summer. During this

season, the site is undisturbed and located at high cliffs, but during winter, the number of vultures counted population falls, possibly due to harsh/extremely cold weather and a scarcity of available food, which can affect vulture presence in an area (Kushwaha & Kanaujia 2010). Human actions also can influence the occurrence of birds including vultures (Margalida *et al.* 2014), and increased human activity may account for lower numbers of vultures counted at Site IV in the summer.

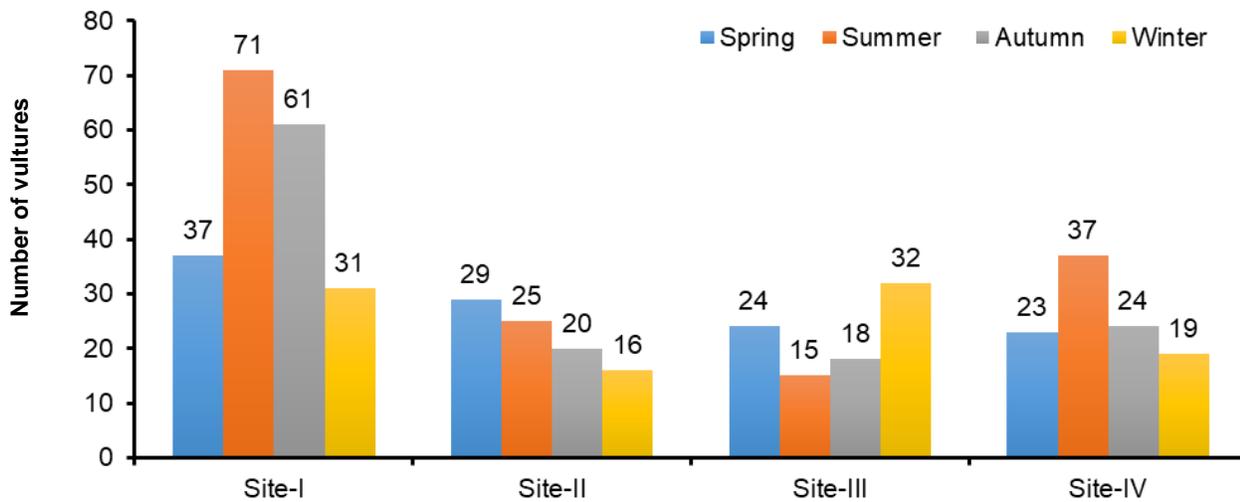


Figure 3: Counts of Egyptian Vultures in different seasons at four sites in northeast Pakistan.

Across all sites, Site I had the highest overall number of vultures that were counted, most likely due to its abundant food resources throughout the year and available nest sites, which both help in sustaining large number of individuals. Similar changes in Egyptian Vulture abundance have been reported elsewhere (Saran & Purohit 2014, Kushwaha & Kanauji 2010). Other investigations have suggested that the maximum number of individuals are seen in summers because of thermal air currents that suit the mode of flight for vultures.

The Egyptian Vulture plays a vital role in our environment as a scavenger. Systematic studies of population dynamics and threats to its existence should be conducted in the study area as well as in all suitable habitats in Pakistan. Conservation of these scavengers and policies to protect them should be taken into consideration before it is too late. Our findings provide a baseline to further monitor these ecologically important scavengers at all four sites which can form an important part of the conservation of this species in Pakistan and regionally.

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